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**OPERATOR'S**  
**MANUAL**  
**1948 FORD**  
**PASSENGER**  
**CAR**  
**MODEL 899A**

*Ford Motor Company*

**3692-47K**

**November 7, 1947**

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**MANUAL**  
**1948 FORD**  
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## FOREWORD

The Ford Motor Company has exercised every care in the designing, selection of materials, and the building of this car, and you may expect it to serve you economically for many thousands of miles. Maintenance of the car in good working order depends on the skill of the driver in its operation, and the prompt application of corrective measures as soon as the need for adjustments and services is apparent.

**Section I** of this book contains information and instructions that will be of assistance in the operation of the car.

**Section II** of this book contains a lubrication chart and recommendations for periodic preventive maintenance service, and also instructions for changing tires. This section also contains various trouble shooting procedures that will prove of assistance when professional aid is not available (see Table of Contents on next page). Authorized Ford dealers are prepared and equipped to take care of any of these services.

**Section III** of this book contains specifications of the entire car and its components.

FORD MOTOR COMPANY  
Service Department

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Section

I

## CONTROLS AND OPERATION

### 1. DESCRIPTION.

The 1948 Ford Passenger Car Model 899A is powered by a 100-horsepower, 8-cylinder engine. The transmission has three forward speeds and one speed in reverse. The rear axle is of the three-quarter floating type. The car is equipped with safety glass throughout. The engine number is also the serial number of the car, and is located on the left side of the frame near the engine left front support. The same number is also located on top of the clutch housing, and is visible through a small opening in the floor. The service brakes at each of the four wheels are of the internal expansion type hydraulically operated. The hand brake lever mechanically operates the brakes at the rear wheels.

### 2. DRIVER'S CONTROLS.

a. **Seat Adjustment** (fig. 2). The driver's seat is easily adjusted by lifting up on the seat adjustment lever and pushing the seat backward or forward as desired.

b. **Window Controls and Door Handles.** The ventilating windows are locked by a latch at the bottom of the window. To unlock the ventilating windows, press the latch button and turn the latch. Each door can be locked from the inside by merely lifting the door handle all the way up.

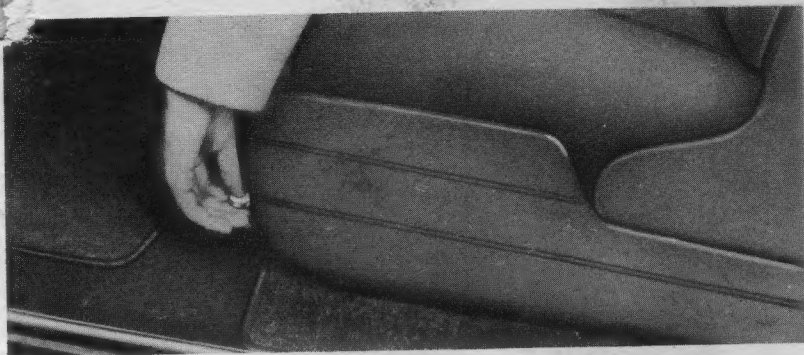
c. **Brake Pedal** (fig. 3). Two shoe hydraulic brakes are provided at each of the four wheels, and are operated by a conventional foot pedal located to the right of the steering column. Each time the brake pedal is depressed sufficiently to apply the brakes, a hydraulically operated switch on the rear of the hydraulic brake master cylinder completes the stop light circuit through the stop light bulbs located in the taillights.

d. **Hand-brake Lever** (fig. 5). The hand-brake lever is mounted to the left of the steering column below the instrument panel. Always be sure that the hand-brake lever is completely released before attempting to move the car. Depressing the brake pedal will assist in releasing the hand brake.



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Fig. 1—Super De Luxe Ford Passenger Car.



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**Fig. 2—Driver's Seat Adjustment**

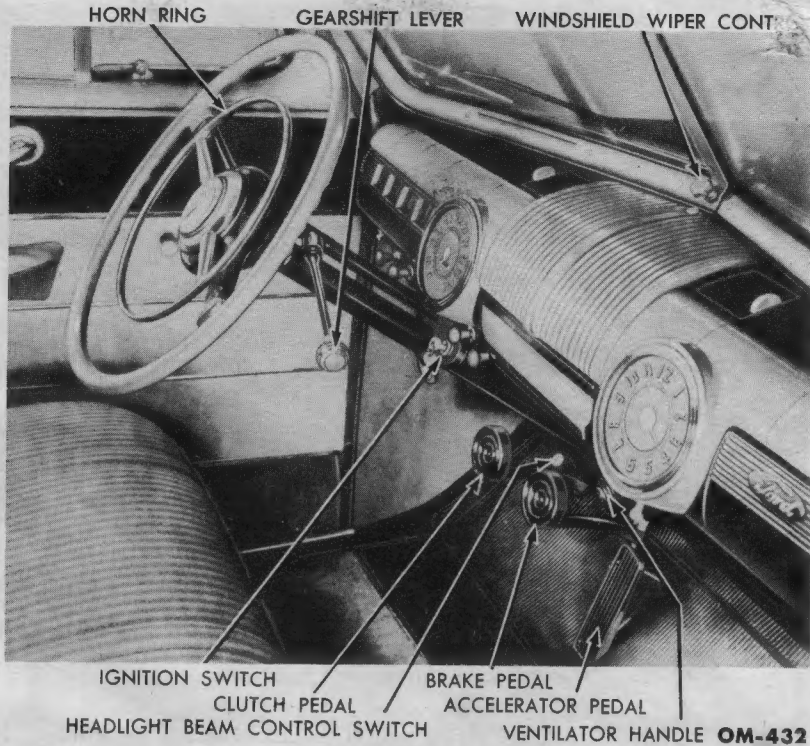
**e. Throttle Controls** (fig. 5). The accelerator pedal is located to the right of the brake pedal, convenient to the driver's right foot. The hand-throttle button is located on the instrument panel to the right of the headlight switch.

**f. Clutch Pedal.** The clutch pedal is located to the left of the steering column in front of the driver's seat, convenient to the driver's left foot. When the clutch pedal is depressed, the clutch is released and the engine is disengaged from the transmission. Avoid driving with the foot resting on the clutch pedal, otherwise premature wear of the clutch may result.

**g. Gearshift Lever.** The gearshift lever is located to the right of, and underneath, the steering wheel. Fig. 4 shows the position of the lever for the various gear ratios.

**h. Windshield Wiper Control.** The windshield wiper is controlled by a knob located over the instrument panel (fig. 3). To operate the wiper, rotate the control knob counterclockwise. The speed of the windshield wiper is controlled by the distance the control knob is turned.

**i. Hood Release.** The hood release handle is located on the left side of the instrument panel (fig. 5). After releasing the hood lock by pulling out the release handle, it is necessary to push a secondary safety catch underneath the front of the hood before the hood can be raised.



**Fig. 3—Driver's Controls**

**j. Convertible Automatic Top.** The automatic top on convertible models is raised or lowered by hydraulic action. This is accomplished through two actuating pistons and cylinder assemblies, one for each side of the top. These assemblies are located within the side structure of the body. Hydraulic pressure is supplied by an electrically driven hydraulic pump which is located under the hood.

(1) **TO LOWER THE TOP.** Unhook the three toggle clamps at the top of the windshield on each side and in the center, and push the front of the top up approximately one inch to free it from the dowels on top of the windshield. A control knob is provided to raise or lower the top. This is located on the left side of the instrument panel and is marked **TOP**. Pull the control knob out, holding it until the top is completely lowered. The two fasteners at each side along the lower edge of the top will release without attention as the top is being lowered. The top may be operated with the windows in either the up or down position.



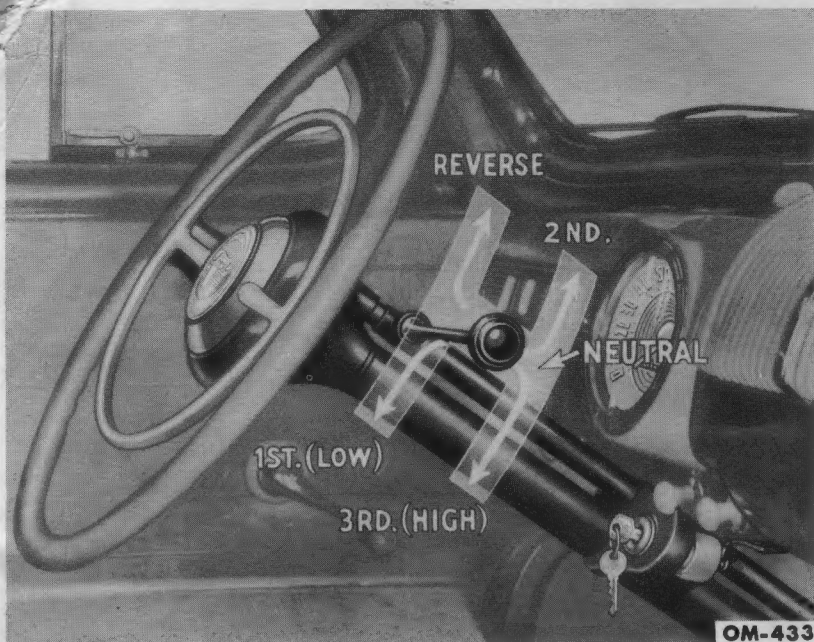


Fig. 4—Gearshift Lever Positions

(2) **TO RAISE THE TOP.** Push the control knob in, holding it until the top is raised to within an inch or two of closing completely at the windshield. Pull the top front header down over the dowels on the top of the windshield, and fasten the three toggle clamps. Snap the two fasteners in place on the lower edge of the top on each side.

(3) **IF THE TOP IS TO BE LEFT DOWN FOR A LONG PERIOD.** If the top is to be left down for a long period, it is advisable to pull the padded portion of the top material out from between the bows and slat irons to prevent chafing the top material. The top boot (stored in the luggage compartment) should be installed and secured with the fasteners.

**CAUTION:** Do not attempt to operate the top when the car is in motion.

### 3. INSTRUMENTS AND GAUGES.

a. **Charge Indicator.** The charge indicator, located in the instrument group, indicates whether there is current flowing into, or out of, the battery. The current is controlled by the generator regulator, and the strength of the current will vary with the electrical load and the condition of the battery. When the voltage of the battery reaches a

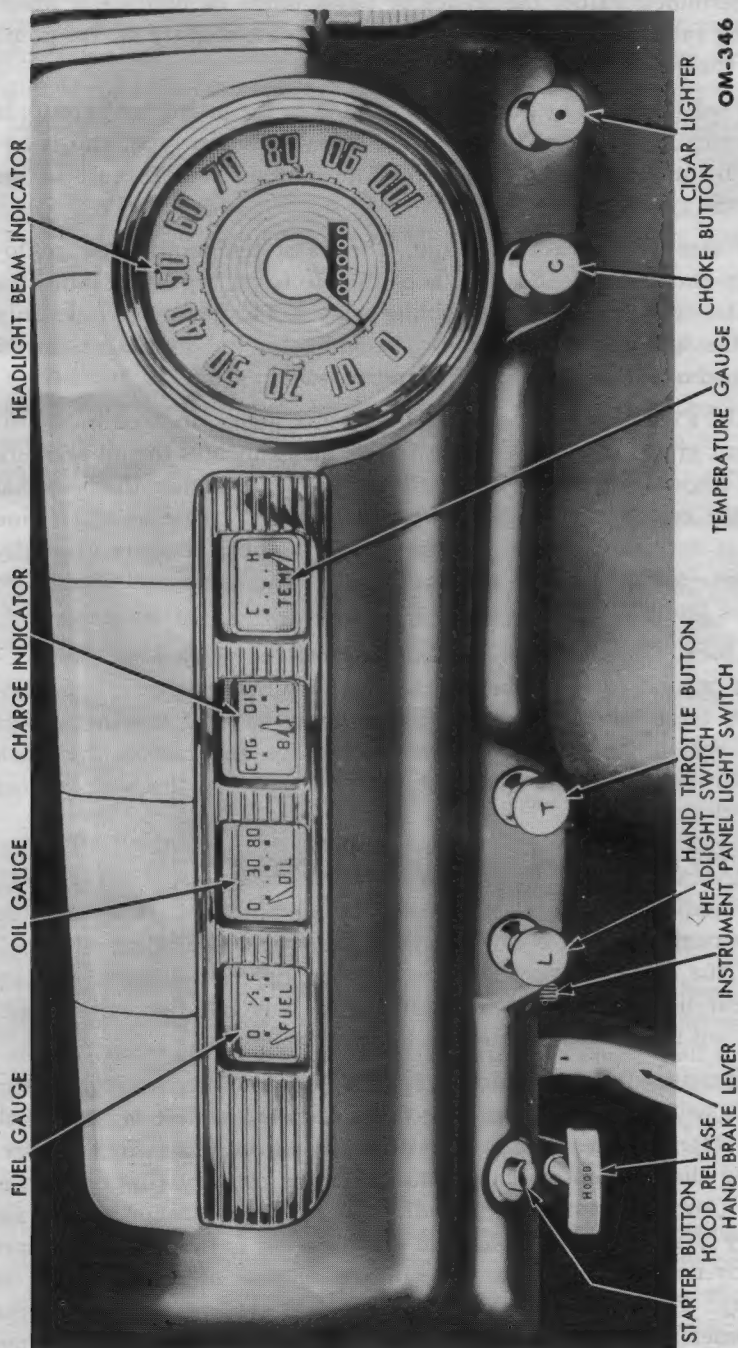


Fig. 5—Instrument Panel

## Section I—Controls and Operation

pre-determined value, the indicator hand tends to indicate a lower charging rate. The indicator hand may fluctuate slightly at this point due to the action of the generator regulator.

**b. Fuel Gauge.** The fuel gauge, located in the instrument group, is an electrically operated gauge of the delayed action type, and is actuated by a float in the fuel tank. The ignition switch must be on before the gauge will register.

**c. Water Temperature Gauge.** The water temperature gauge, located in the instrument group, is of the electrical type, and indicates the water temperature in the cooling system. The gauge operates only when the ignition switch is on. The indicator hand rests at the H (hot) end of the gauge when the ignition switch is off.

**d. Oil Pressure Gauge.** The oil pressure gauge, located in the instrument group, is of the electrical type, and indicates the oil pressure to the engine bearings. The oil pressure will be higher than normal when the engine is cold. The oil pressure will decrease as the engine speed is decreased. Failure of the gauge to show pressure generally indicates insufficient oil, and the level of the engine oil should be checked immediately.

**e. Clock.** On the Super De Luxe model the clock is of the electrically wound type, rewinding itself approximately every four minutes. A reset knob is located on the lower edge of the instrument panel. When the battery is disconnected for any reason, the clock becomes inoperative. A 3-ampere fuse is located in the wire leading to the clock.

### 4. SWITCHES, KEYS, AND MISCELLANY.

**a. Headlight Switch.** The headlight switch knob is located on the instrument panel below the instrument group. Pulling the knob out of the first position lights the parking lights, tail lights, and instrument lights. Pulling the knob all the way out lights the headlights, tail lights, and instrument lights.

**b. Headlight Beam Control Switch (fig. 3).** The headlight beam control switch is located on the floorboard to the left of the clutch pedal. After the headlights have been turned on, this switch is operated by the left foot to change to either the country (upper) or the traffic (lower) beam of the headlights. The upper beam is used for country driving where maximum illumination is desired. The lower beam is used when approaching oncoming cars or when driving in the city. The headlight beam indicator, located at the top of the speedometer face, consists of a small red jewel which is illuminated when the headlights are switched to the upper beam.

c. **Instrument Panel Light Switch.** The instrument panel light switch is located on the bottom flange of the instrument panel near the hood release knob. Turning the switch permits the driver to dim, brighten, or turn off the instrument lights as desired. The headlight switch must be on in order to turn the instrument panel lights on.

d. **Starter Button.** The starter button is located on the lower left side of the instrument panel. When the starter button is pushed in, it causes the starting motor to crank the engine.

e. **Ignition Switch** (fig. 3). The ignition switch is located on the steering column bracket which supports the steering column at the instrument panel. With the ignition switch turned to the right, the ignition circuit, the fuel level gauge, the water temperature gauge, and the oil pressure gauge circuits are completed. With the switch turned to the left, only the instruments and accessories are turned on.

f. **Keys.** The key code numbers are indicated on metal tags attached to the keys. Keep a record of these key code numbers so that in case of loss, new keys may be ordered by code number. The one key fits both the steering lock and the door lock. A second key fits both the glove and rear compartments.

g. **Jack.** A ratchet type bumper jack is provided in the luggage compartment.

## 5. STARTING THE ENGINE.

a. **Preliminary Instructions.** Before attempting to start the engine, make sure that the function of each control and the significance of the readings on the various instruments are thoroughly understood. Be sure the gearshift lever is in neutral position (fig. 4).

b. **Warm Weather Starting** (Temperature Above Freezing). Turn the ignition switch on. Hold the clutch pedal down, and press the starter button. If the engine does not start properly, pull the choke button part-way out. *NOTE: If the engine is hot and does not start promptly, hold the hand-throttle button out while the engine is being cranked. Do not use the choke. If the engine fails to start, refer to par. 11.*

c. **Cold Weather Starting** (Temperature Below Freezing). Turn the ignition switch on. Pull the choke button all the way out. Hold the clutch pedal down, and press the starter button. As the engine starts, push the choke button in gradually as far as possible without disturbing the smooth running of the engine. As soon as the engine is



warmed up, push the choke button all the way in. Avoid racing the engine while it is cold. If the engine fails to start, refer to par. 11.

## 6. DRIVING.

a. **Setting the Car in Motion.** Release the hand-brake lever. Fully depress the clutch pedal so that the clutch will be completely disengaged. Move the gearshift lever up and backward into first gear position (fig. 4). Depress the accelerator pedal slightly to speed up the engine. As the engine speed increases, gradually and smoothly engage the clutch. As the clutch engages and the car starts to move, increase the pressure on the accelerator pedal so the engine will pick up the load.

b. **Changing to Higher Gears.** At a speed below 10 miles per hour, depress the clutch pedal, and at the same time release the pressure on the accelerator pedal. Move the gearshift lever out of the first gear position through neutral and into the second gear position (down and forward, fig. 4). After this shift is completed, engage the clutch without any hesitancy, and at the same time press down on the accelerator pedal. At a car speed between 10 and 20 miles per hour, follow the same procedure as outlined above, and move the gearshift lever straight back into the third or high gear position.

c. **Backing the Car.** To avoid possible damage to the transmission gears, the car must be brought to a complete stop before shifting into reverse gear. To operate in reverse, disengage the clutch and move the gearshift lever up and forward (fig. 4). Speed up the engine slightly by putting a slight pressure on the accelerator pedal. Engage the clutch, and at the same time exert slightly more pressure on the accelerator pedal so that the engine will pick up the load smoothly.

d. **Negotiating Turn.** It is better to go into a turn slowly, increasing the speed during the turn, rather than to enter the turn too fast and have to apply the brakes during the turn. The driver should anticipate each turn as much as possible.

e. **Operation on Hard Pulls.** Never "lug" the engine at wide open throttle. Shift to a lower gear.

f. **Use of Gauges on the Instrument Panel.** The driver should be familiar with all of the gauges, and should note their readings frequently while operating the car. The temperature gauge and the oil pressure gauge give the most satisfactory indications of the engine performance. When the readings of these instruments appear to be abnormal, stop the engine and determine the cause. Check the oil pressure and water temperature gauge readings frequently.

**g. Stopping the Car.** Remove the foot from the accelerator pedal. Except in emergency stops, this should be done some distance before reaching the point where the car is to stop so that the compression of the engine will slow down the car. Apply the brakes by pressing down on the brake pedal. When the speed has been reduced to approximately 7 miles per hour, disengage the clutch and move the transmission gearshift lever into the neutral position (fig. 4), maintaining pressure on the brake pedal until the car stops. Apply the hand brake if the car is to be parked. Don't park with the car in gear as this may force the transmission gear to absorb shocks that normally would be absorbed by the car bumpers.

## 7. OPERATION UNDER UNUSUAL CONDITIONS.

**a. Operation in Cold Weather.** When temperatures of 10°F. below zero or lower prevail, S.A.E. 10 or 10W oil diluted with 10% kerosene should be used in the engine. Cold weather starting problems are always the result of poor preparation or maintenance of the car, and, in addition to the causes of failure to start, as outlined in par. 11, they can be attributed to either the engine oil being too heavy for the temperature encountered or the battery being low in charge.

**b. Antifreeze Solution.** Ford antifreeze may be obtained from Ford dealers. Ethylene glycol or alcohols containing proper rust inhibitors are also satisfactory antifreeze solutions.

**c. Draining the Cooling System.** A drain valve is provided at the bottom of the radiator on the left side. It is important when the cooling system is refilled with fresh water, after draining (when antifreeze is not being used), that a rust inhibitor be added. This inhibitor can be obtained from Ford dealers.

**d. Operation at High Temperatures.** When operating at high temperatures, observe the water temperature gauge reading frequently, adding water to the cooling system as often as may be required to prevent overheating. The viscosity of the engine oil decreases at high temperatures. Be sure the oil being used has sufficient body for the prevailing temperature. (See lubrication chart, fig. 6.) Engine oil thinned out by high temperature is used up more rapidly. Check the engine oil level frequently.

**e. Operation at High Altitudes.** High altitudes result in lowering of compression due to lowered atmospheric pressure and a corresponding lowering of the developed horsepower. Due to rarefied atmosphere, a smaller quantity of air is taken into each cylinder while the quantity of fuel remains practically the same as at sea level.

This results in the fuel air mixture being too rich. This can only be remedied by installing smaller carburetor jets if the car is to be operated continually at high altitudes. Generally speaking, elevations up to 5,000 feet present no particular carburetion problems.

**f. Operation Under Dusty Conditions.** When driving the car over dusty roads, the crankcase breather screen in the oil filler cap and the carburetor air cleaner should be cleaned frequently (fig. 6). Cars operated under dusty conditions should have the engine oil and oil filter cartridge changed as often as necessary to keep the oil free from dust.

## Section

## II

MAINTENANCE, TIRES, AND  
TROUBLE SHOOTING

## 8. MAINTENANCE.

a. **General.** The inspection, preventive maintenance, and lubrication of the car has been divided into two separate operations, a 1000-mile preventive maintenance service and a 5000-mile or twice-yearly preventive maintenance service. These operations include services and inspections that will go far to assure continued trouble-free operation. It is desirable to have the 5000-mile procedure performed every spring and fall so as to include operations that prepare the car for the approaching seasons. Authorized Ford dealers are prepared and equipped to take care of these services, or supply detailed instructions, for those owners who wish to do their own work. Regardless of who does this work, the important thing is that the car receives this periodic attention. Fig. 6 shows the lubrication points, type of lubricant, procedure, and lubrication periods.

On convertible models, the hydraulic fluid supply should be checked by a Ford dealer each 5000 miles. The hydraulic fluid in the reservoir, located under the hood, should be kept to the level mark with Ford Brake Fluid No. M-3833.

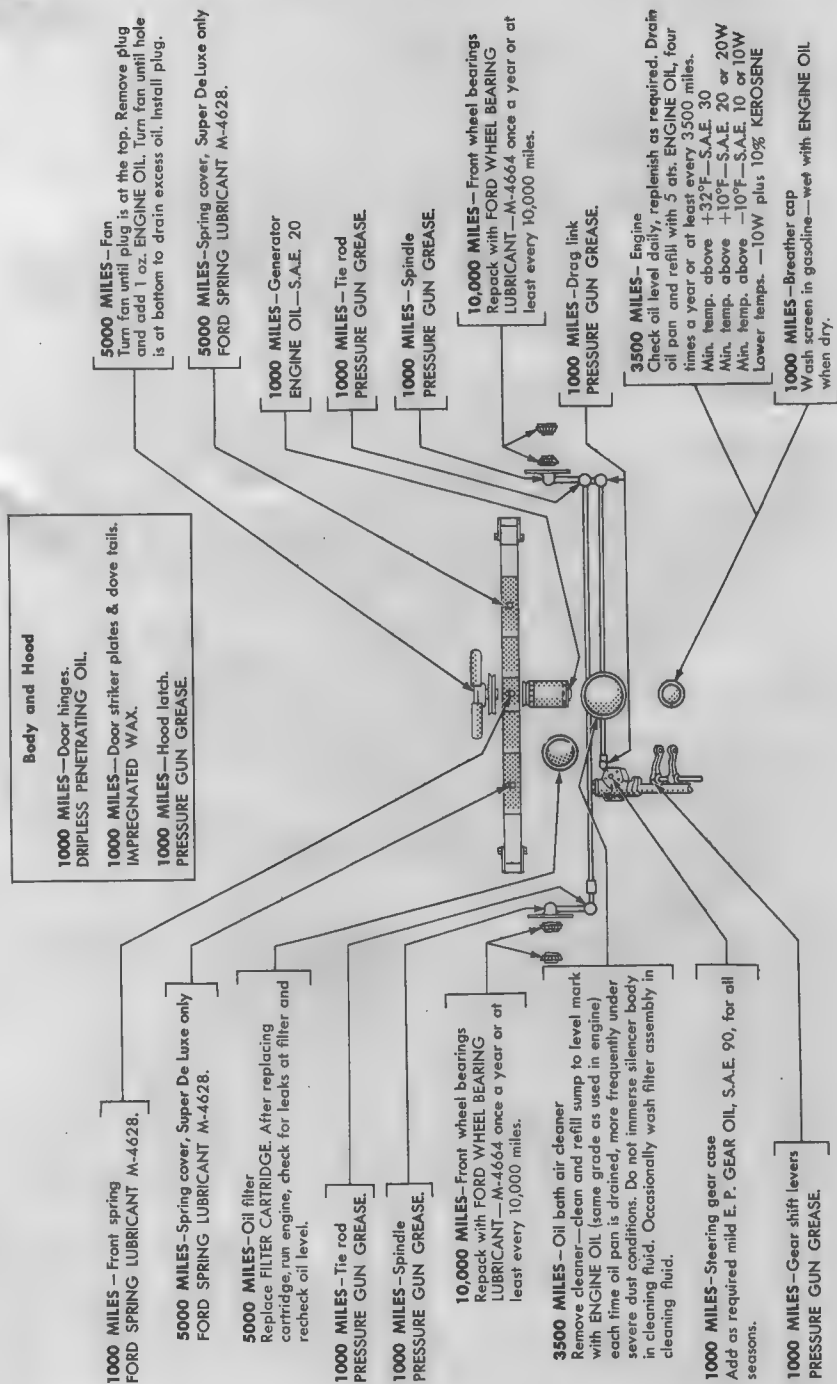
b. **Points Requiring No Lubrication Service.** Water pumps, clutch release bearing, clutch pilot bearing, starting motor, and distributor require no lubrication service.

c. **Oil Changes.** Engine oil should be changed as follows:

(1) **NEW CARS OR AFTER ENGINE OVERHAUL.** After operating a new car for the first 300 miles, the engine oil should be changed. Drain the oil from the engine by removing the oil pan drain plug. Reinstall the plug, and fill the oil pan with 5 quarts of oil of the proper viscosity.

(2) **SUBSEQUENT OIL CHANGES.** The oil pan should be drained and refilled with fresh oil every 3500 miles or not less than four times each year, or at any time when the oil becomes excessively diluted or polluted. It is advisable to use the accumulated mileage indicated on the speedometer as a guide for oil changes.





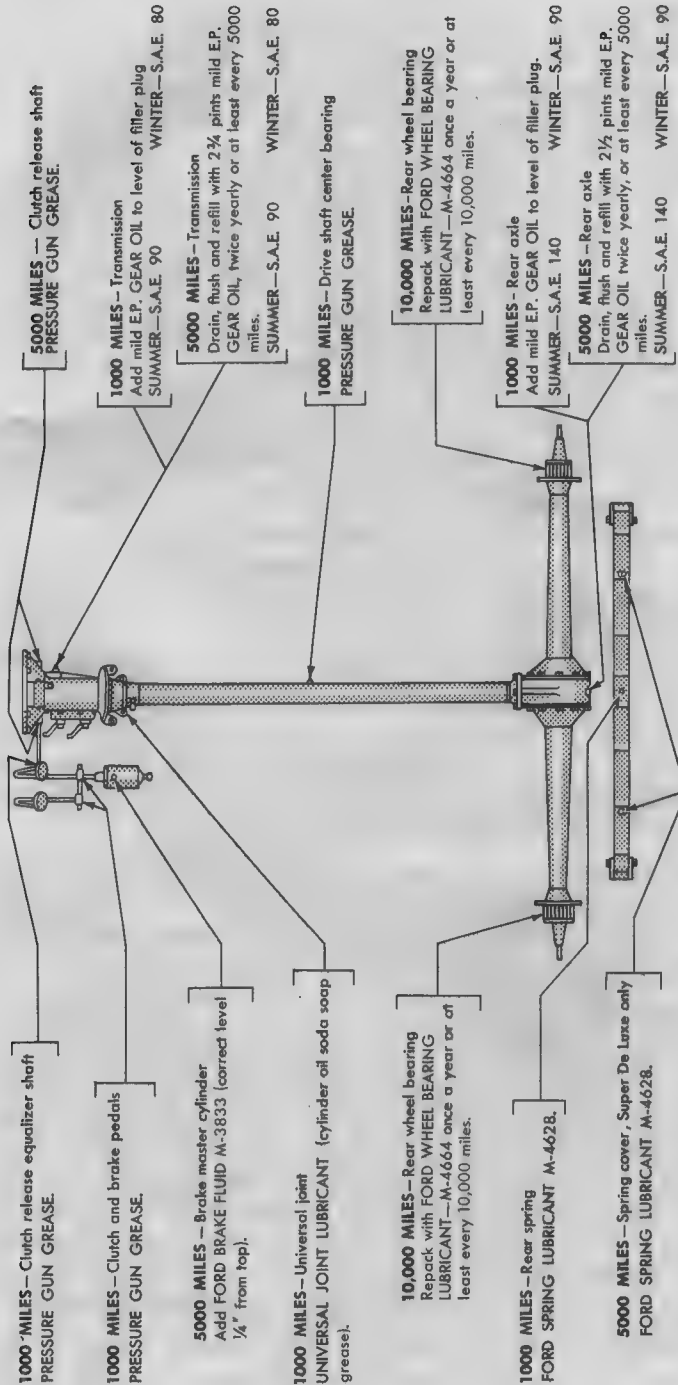


Fig. 6—Lubrication Chart

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## 9. TIRES.

a. **Changing Wheel.** Before placing the jack in position to raise the car, make sure the hand-brake lever is firmly applied. Place the jack underneath the bumper and raise the car. Pry off the hub cap with a tire iron, remove the wheel nuts and lift off the wheel. To install the wheel, place it over the hub studs, install the wheel nuts and tighten them securely. Replace the hub cap. Lower the car and remove the jack.

### b. Removing Tire from Wheel.

(1) **REMOVE TOP BEAD.** Remove the wheel as outlined above. Remove the valve core to deflate the inner tube completely. Loosen both tire beads from the wheel rim ledges, using a tire iron if necessary. With the wheel lying flat on the floor, stand on the tire with feet about 15 inches apart, opposite the valve, and force the tire bead off the rim ledge and into the drop center part of the wheel rim.

**CAUTION:** Care should be taken that the soft rubber tip on the inner edge of the tire bead is not damaged by the tire iron, as such damage will have a tendency to chafe the inner tube. It is advisable to coat the tire beads with soft soap, which will assist in removing the beads over the edge of the wheel rim and will also protect the inner edge of the beads. Insert two tire irons about 8 inches apart between the tire bead and the wheel rim near the valve, and pry the short length of the bead over the wheel rim. Leaving one tire iron in position, follow around the wheel rim with the other tire iron to remove the remainder of the bead. Remove the tube.

(2) **REMOVE BOTTOM BEAD.** Stand the wheel in an upright position with the bead in the drop center part of the rim at the bottom. Insert the tire iron between the bead and the wheel rim at the top side of the wheel, and pry the wheel out of the tire.

### c. Installing Tire on Wheel.

(1) **INSTALL BOTTOM BEAD.** Install the valve core in the inner tube valve stem, inflate the tube until it is barely rounded out, and insert it in the tire casing. See that the balancing mark on the casing is opposite the valve stem. Before mounting the tire casing on the wheel, use soft soap on the tire beads. Place the tire on the wheel rim, guiding the valve through the valve hole. Push the bottom bead down into the drop center part of the rim at the valve and force the remaining portion of the bead over the rim. A tire iron may be needed to pry the last portion of the bead over the rim.

(2) **INSTALL TOP BEAD.** At a point on the opposite side of the wheel from the valve, insert a tire iron between the top bead

and the wheel rim, prying the bead over the rim. Holding this iron in position, continue prying with the other iron, working around the rim until the bead is in place. Inflate the tube slowly, and see that the tire is centered on the rim on both sides. This "centering" may be done by bouncing the tire after approximately 15 pounds of air pressure has been added. Finish inflating the inner tube to the recommended pressure.

## 10. TROUBLE SHOOTING.

*NOTE: Troubles that are experienced by owners are the result of normal wear or deterioration or are the result of neglect. The preventive maintenance service referred to in par. 8, if followed, practically assures trouble-free operation and you are urged to make arrangements with your authorized dealer to provide these services at the prescribed intervals.*

The following pars. contain trouble shooting information and tests which can help determine the causes of some of the troubles that may develop. The diagnosis of troubles start with symptoms that are apparent, and the procedure given here under one symptom will uncover additional symptoms consecutively until the underlying cause of the trouble and its remedy is apparent. Under each major par. heading, various symptoms are headed by lettered sub-par. headings in **bold face type**. Select the symptom that most nearly agrees with the trouble being experienced, and follow the procedure in the order given.

## 11. ENGINE.

### a. Engine Cranks But Will Not Start.

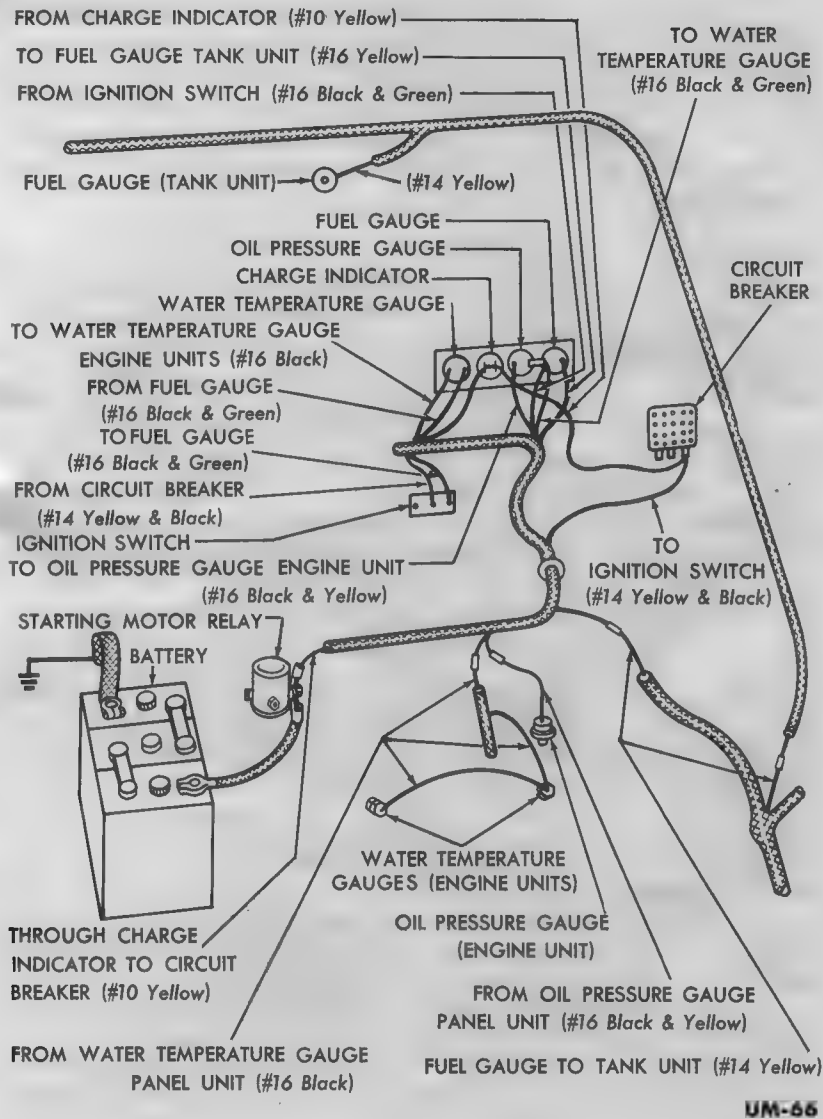
(1) **PRELIMINARY INSTRUCTIONS.** Make sure the ignition switch is on. If the engine is wet, wipe all moisture from the distributor cap and spark plugs. If the engine is hot, hold the hand throttle open and crank the engine. This will dispose of any vapor lock which may be present. If the engine is extremely cold, refer to par. 5 c.

(2) **DETERMINE IF CURRENT IS BEING DELIVERED TO SPARK PLUGS.** Turn the ignition switch on. Remove the wire from any spark plug and hold it  $\frac{3}{16}$  inch from the cylinder head while the engine is being cranked. If the spark does not jump this gap, proceed with par. 19 a.

(3) **CHECK FUEL SYSTEM.** Remove the carburetor drain plug. If fuel does not flow from this opening, fuel is not reaching the carburetor, proceed with par. 17 b "Fuel Not Reaching Carburetor."

### b. Engine Starts But Fails to Keep Running. If the engine



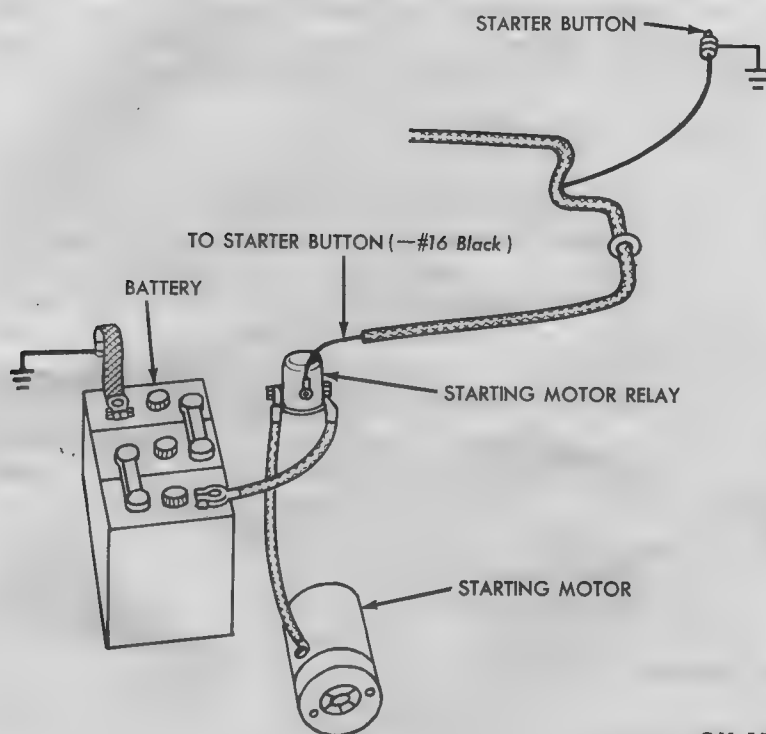


**Fig. 7—Fuel Gage, Oil Pressure Gage, and Water Temperature Gage Circuits**

starts, but stops after a short period of running and cannot again be started, it usually indicates that fuel is not reaching the carburetor, proceed with par. 17 b "Fuel Not Reaching Carburetor."

**c. Engine Misfires on Fast Acceleration or Hard Pull.**

(1) **TEST SPARK AT SPARK PLUG WIRES.** Turn the igni-



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**Fig. 8—Starting Motor Circuit**

tion switch on. Remove the wire from any spark plug, and hold it  $\frac{3}{16}$  inch from the cylinder head while the engine is being cranked. If the spark does not jump this gap, proceed with par. 19 a. If a satisfactory spark is obtained from each spark plug wire, proceed with subpar. (2) below.

(2) **CLEAN, SPACE OR REPLACE SPARK PLUGS.** Clean and space the spark plug gaps to 0.025 inch. Replace any spark plugs having burned electrodes or cracked porcelains. Check the compression of each cylinder.

(3) **CHECK CARBURETOR ACCELERATING PUMP.** Three holes are provided in the throttle lever for the accelerating pump link, to provide a means of adjusting the accelerating pump stroke. No. 1 hole is used for extremely hot temperatures. No. 2 hole for medium temperatures, and No. 3 hole for extremely cold temperatures. Make sure the accelerating pump link is in the proper hole for

the prevailing temperature. Remove the air cleaner and observe if a spray of gasoline comes from the discharge nozzles (located inside of the carburetor air throat) each time the throttle is opened. Repair or replace the carburetor if no spray or a very light spray is observed.

## 12. COOLING SYSTEM.

**a. Engine Overheats.** Allow the engine to cool gradually, then fill the cooling system and idle the engine. Check for leakage at all hose and hose connections, radiator cap gasket, cylinder head gaskets, and the radiator, and repair or replace the necessary parts as required. Remove any insects, leaves, or dirt from the radiator fins and air passages. Adjust or replace the fan belt if required. Flush the cooling system, using cooling system cleaner kit part number 81A-18442, according to directions on the container.

**b. Engine Fails to Reach Normal Operating Temperature.** If the water temperature gauge fails to read H (hot) with the ignition switch off, the gauge is at fault. Run the engine at idle speed. Cover the front of the radiator until the engine temperature reaches normal. If the water temperature gauge reading does not rise to normal, the trouble is in the water temperature gauge units or in the circuit (fig. 7). If the heat indicator is functioning satisfactorily, remove and test the thermostats, replacing them if necessary.

## 13. STARTING SYSTEM.

**a. Engine Will Not Crank When Starter Button is Pressed.**

(1) **TEST BATTERY AND CIRCUIT.** Test the state of charge of the battery. Recharge the battery if it is low in charge. Make sure the starting motor relay and starting motor connections, including all ground connections in the starting motor circuit (fig. 8), are clean, tight, and in good condition. If the engine does not crank, proceed with subpar. (2) below.

(2) **TEST FOR OPEN CIRCUIT IN STARTING MOTOR.** Connect a voltmeter across the battery terminals and observe the voltage reading. Press the starter button and if the voltage drop is less than one (1) volt, an open circuit exists in the starting motor or the starting motor relay. Remove and repair or replace the starting motor or relay. If the voltage drop is greater than one (1) volt when the starter button is pressed, the starter drive gear is probably locked. Put the transmission in high gear and rock the car forward and backward. If this does not dislodge the locked starter gear, loosen the bolts that attach the starter to the engine and release the gear. If the engine still will not crank, remove the spark plugs and attempt to crank the

engine with the starting motor. Follow whichever of the following that apply.

(a) **IF THE ENGINE WILL NOW CRANK.** If the engine will now crank, water probably has been leaking into the cylinders. Remove the cylinder heads and inspect and replace gaskets, if necessary. Check for cracked cylinder heads or cylinder block.

(b) **IF ENGINE WILL NOT CRANK.** If the engine still will not crank after the spark plugs have been removed, a reciprocating part in the engine is seized or the starting motor is shorted. Repair or replace the starting motor or remove the engine oil pan and make the necessary repairs to the engine.

#### 14. BATTERY AND GENERATING SYSTEM.

**WARNING:** *Do not allow flames or sparks to be brought near the vent openings of the battery since hydrogen gas, produced in the course of the battery's normal operation in the car, may be present in the battery and might explode. The liquid in the battery is a solution of sulphuric acid which, if accidentally spilled on the skin or spattered in the eyes should, as a first-aid measure, be flushed away promptly with quantities of clear water only. Seek medical aid if discomfort continues. If acid is spilled on the clothes, wet it thoroughly with a weak solution of ammonia or with sodium bicarbonate or baking soda dissolved in water.*

a. **Battery Runs Down.** Excessive use of electrical accessories should be avoided when the generator is not operating. Be sure that the ignition or light switches are not left on when the car is not in use. Recharge the battery, and connect the cable to the negative battery post. Turn all switches off. Connect an ammeter between the positive battery cable and the positive post of battery. Any reading indicates there is a grounded or short-circuited wire in one of the electrical circuits. Connect the positive battery cable to the battery. Ground the terminal marked ARM on the generator regulator through an ammeter. If a reading is obtained, it indicates the cutout points in the regulator are stuck together. Replace the generator regulator. If no reading is obtained, check for grounded or shorted wires in the ignition circuit (par. 19), the starting motor circuit (par. 13), the light circuit (par. 15), and the horn circuit (par. 16).

b. **Charge Indicator Does Not Show Charge.** If the charge indicator fails to show a charge, turn on all lights and observe if a discharge is shown. If no discharge is observed, replace the charge indi-



cator. If a discharge reading is obtained, proceed with subpar. c below.

**c. Generator Does Not Charge Battery.** Check all wires for loose connections, frayed insulation and high resistance in connections, and repair or replace wiring if necessary. Remove the armature wire from the ARM terminal of the regulator. Remove the field wire from the FIELD terminal on the regulator. Start the engine and, with it running at idling speed, touch the free end of the armature and field wires to the BAT terminal of the regulator. Increase the engine speed, noting the charging rate. If the generator charge does not increase, the generator is at fault. Repair or replace the generator. If the generator charge increases as the engine is speeded up, the generator is operating normally. Repair or replace the generator regulator.

**d. Low Charging Rate When the Battery is Low in Charge.** Tighten all generator circuit connections. Drive the car on the road at approximately 30 miles per hour for 10 to 15 minutes. If the charging rate increases to maximum and holds at this point, the generating system is functioning normally. If the charging rate does not increase to maximum, or increases to maximum and cuts back quickly, repair or replace the generator regulator.

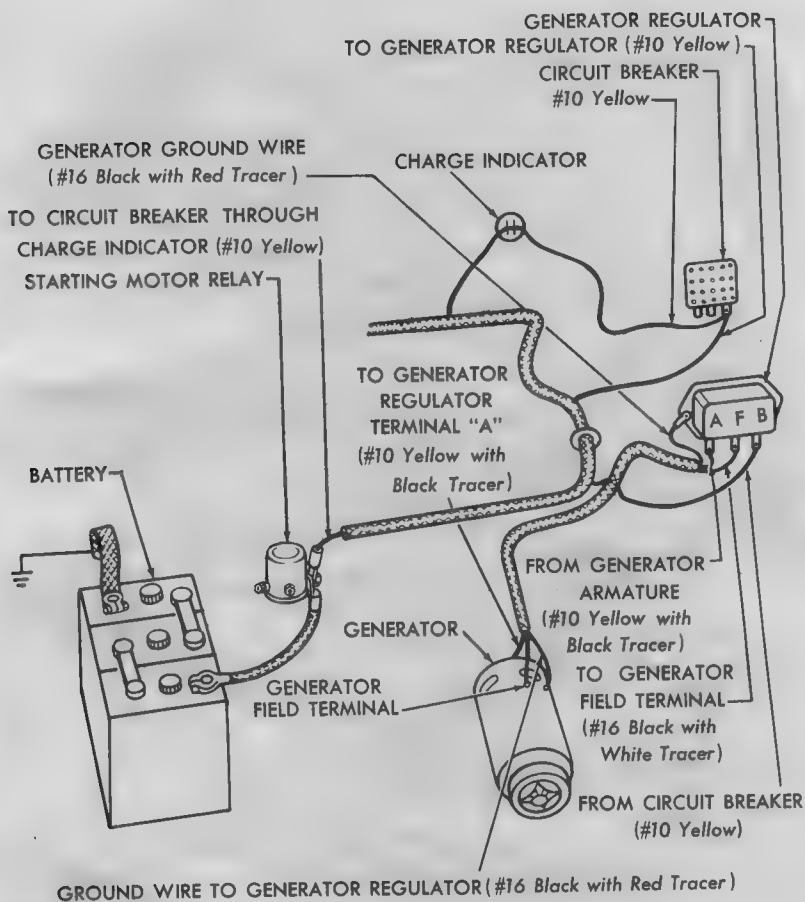
**e. High Charging Rate When Battery is Fully Charged.** Disconnect the yellow wire from the B terminal (fig. 9) of the circuit breaker located on the dash in the driver's compartment, and connect an ammeter between the yellow wire and the circuit breaker terminal. Drive the car on the road at approximately 30 miles per hour for 10 or 15 minutes. If the ammeter shows a charging rate in excess of 15 amperes during the test, the voltage setting of the regulator is too high. Repair or replace the generator regulator.

**NOTE:** *If the battery gases freely and uses water excessively, this also is an indication of too high a charging rate.*

## 15. LIGHTING SYSTEM.

**a. No Lights Will Light and All Electrical Units are Inoperative.** Test the state of charge of the battery. If the battery is discharged, recharge or replace the battery. Clean and tighten the battery connections, battery ground connection, and battery cable connection at the starter relay.

**b. No Lights Will Light and All Electrical Units are Inoperative Except the Starting Motor.** Contact one lead of a test light to the terminal marked B on the circuit breaker (fig. 10). Contact the other lead to ground. If the test light does not light, the fault lies

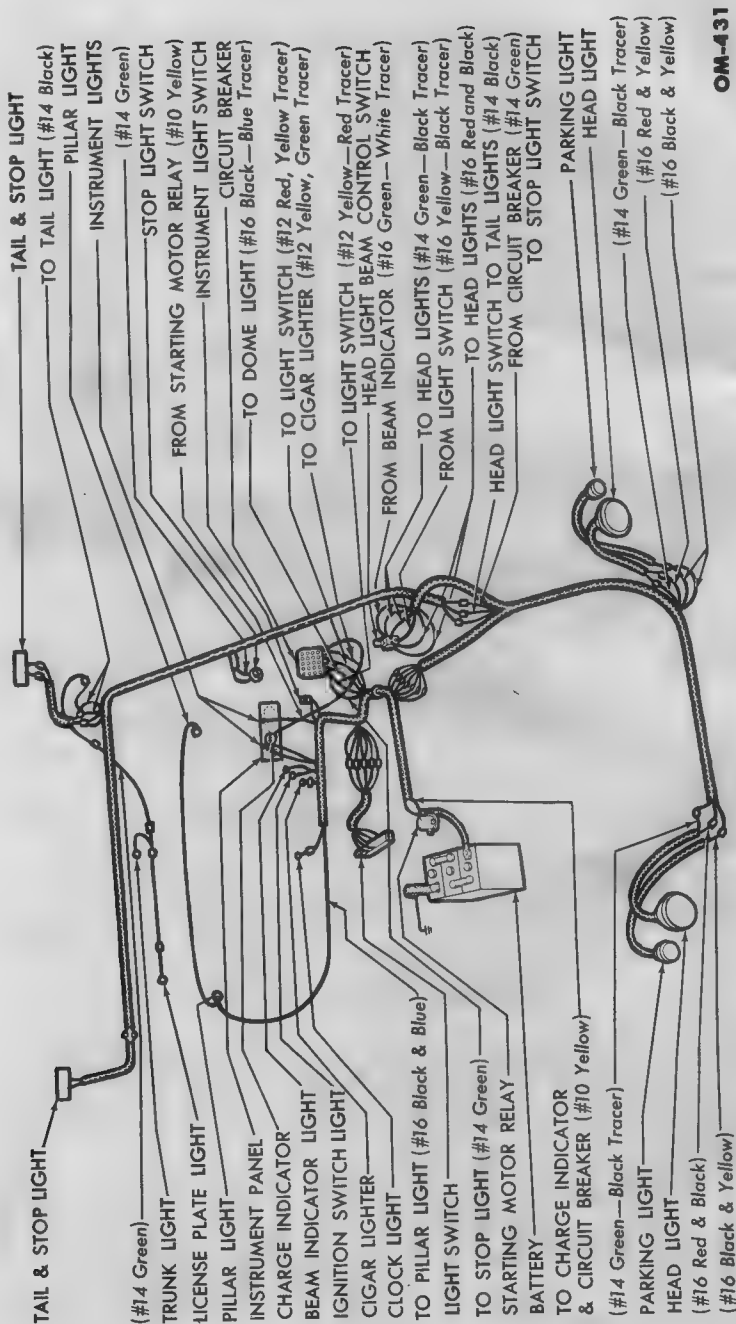


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Fig. 9—Generating Circuit

in the main feed wire which extends from the terminal marked B on the circuit breaker through the charge indicator to the battery terminal on the starter relay. Tighten all terminals on the wire or replace the wire as required.

c. **Lights Flicker from Bright to Dim.** If any lights flicker from bright to dim, it indicates that the circuit breaker is operating as a result of a grounded or shorted wire in that particular circuit. Pull the light switch to each of its positions to determine which light circuit is grounded and check all wires in that circuit for worn insulation, and make corrections as required.



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Fig. 10—Lamp Circuit

**d. Individual Lights Do Not Light.** Replace any bulbs burned out. If this does not correct the trouble, check for loose connections at the lights and tighten any connections found loose. Replace any damaged wires to the individual unit giving trouble.

**e. One or More Lights Burn Out Repeatedly.** Clean and tighten all connections, including the battery cable connections. Make certain the battery is fully charged, and make a road test. If, after the generator has replaced the current that was used in starting, the road test shows the charging rate to be in excess of 15 amperes, it can be assumed that the voltage setting of the regulator is too high. Repair or replace the generator regulator.

## 16. HORN.

**a. Horn Will Not Sound.** Press down on the horn-button-ring, at the same time turning it counterclockwise until it can be lifted from the steering wheel. Ground the horn with a screwdriver. If the horn sounds, the button is not making contact with ground, repair or replace the button. Inspect the bullet connection at the bottom of the steering gear. If this connection is satisfactory and the horn still does not sound, repair or replace the horn.

**b. Horn Sounds Continuously.** Press down on the horn-button-ring, at the same time turning it counterclockwise until the button can be lifted from the steering wheel. If the horn stops sounding, the button is shorted and must be repaired or replaced. If the horn continues to sound, disconnect the horn wire at the bullet connection at the bottom of the steering column. If the horn stops sounding, replace the horn button wire. If the horn continues to sound, a short circuit exists between this bullet connection and the horn, or in the horn relay.

## 17. FUEL SYSTEM.

**a. Excessive Fuel Consumption.** Usually excessive fuel consumption is the result of an accumulation of maladjustments brought about by normal wear, and if the twice-yearly preventive maintenance and lubrication service, referred to in par. 8, is due or nearly due, this service usually will correct the trouble. During this procedure, pay particular attention to misalignment of the front wheels, tire underinflation, spark plug and distributor point settings, excessive carbon, loss of compression, carburetor float setting and restricted exhaust. Driving habits have a direct bearing on fuel consumption. High engine speeds require extra fuel. Fast acceleration, particularly in the lower gear ratios, uses considerably more fuel than would be used if higher gear ratios were used at lower speeds.

**b. Fuel Not Reaching the Carburetor.** Make sure that there is sufficient fuel supply in the tank and that the fuel tank vent is open. Remove the flexible tube from the fuel pump and replace it if it leaks air or if the passage is obstructed. Blow through the fuel line extending to the fuel tank to make sure there is no obstruction in the fuel line. Remove the fuel pump cap, and clean the sediment chamber and screen. Remove the fuel line between the fuel pump and the carburetor and blow through the line to make sure there is no obstruction in the line. With the ignition switch off, crank the engine with the starter. If a flow of fuel is not evident, it indicates the fuel pump is not functioning and must be repaired or replaced. If the fuel pump and fuel line are found satisfactory, remove the carburetor and clean and check the float needle valve. **NOTE:** *In freezing weather, water in the fuel tank, fuel line, or fuel pump may freeze and restrict the fuel from entering the carburetor. Place the car in a heated garage to thaw out the fuel system. Remove the drain plug and drain any accumulation of water or sediment from the tank.*

**c. Carburetor Floods.** **NOTE:** *In addition to the engine running unevenly, a strong odor of gasoline usually is present when the carburetor is flooding. If the carburetor is flooded due to overchoking, open the hand throttle fully and crank the engine to exhaust the rich gases.* Remove the carburetor and disassemble and clean all parts. Check the float for leakage and the condition of the float valve and seat. Set the float level.

## 18. TRANSMISSION.

**a.** If the transmission is difficult to shift, the clutch should be checked for drag. If the transmission jumps out of gear or is noisy, realinement of transmission on the engine, removal of the transmission cover assembly or removal of the complete transmission may be necessary to correct the trouble.

## 19. IGNITION SYSTEM.

**a. No Spark Delivered from Any Spark Plug Wire.**

(1) **PRELIMINARY INSTRUCTIONS.** Check and tighten, if necessary, all ignition primary circuit wire connections and battery cable connections. Make sure the condenser is grounded. Again attempt to start the engine. If the engine still does not start, proceed as follows:

(2) **PROCEDURE.** With the ignition switch turned off, connect a jumper wire from the negative post of the battery to the terminal marked BAT on the coil and crank the engine with the starting motor.

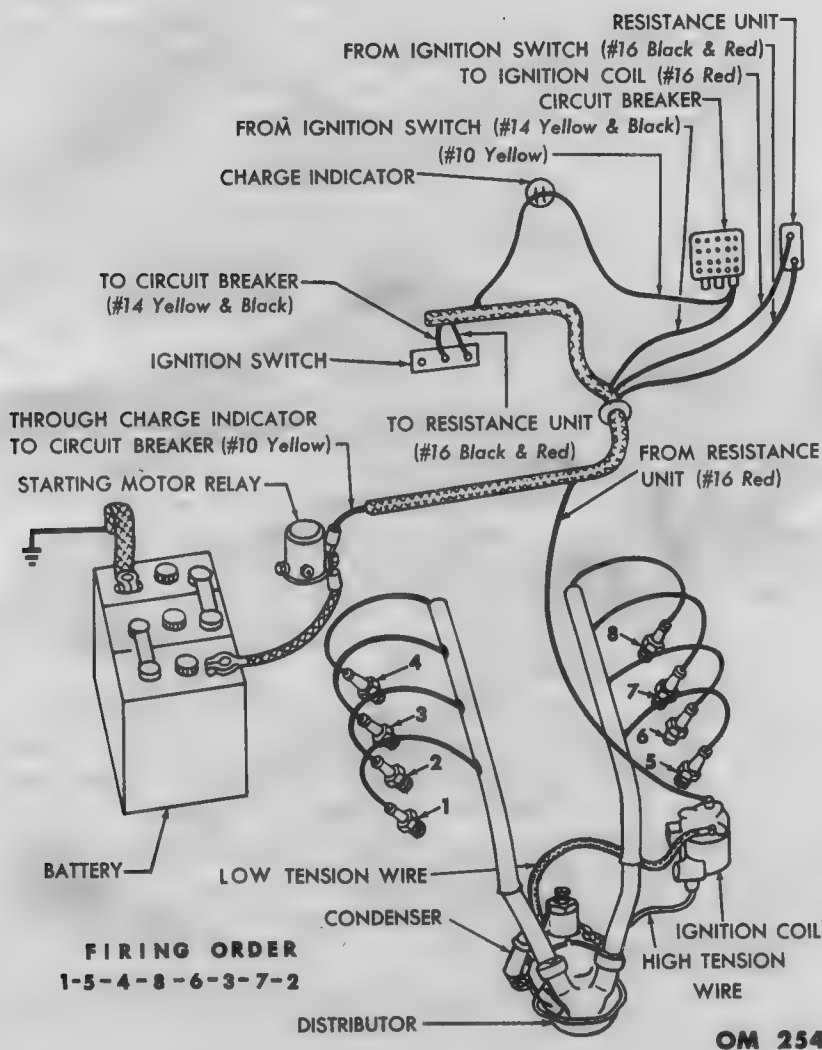


Fig. 11—Ignition Circuit

If the engine does not start, proceed with subpar. (4) below. If the engine starts and a satisfactory spark is delivered to all of the spark plugs, check the primary circuit (subpar. (3) below).

(3) **CHECK CONTINUITY OF PRIMARY CIRCUIT.** Turn the ignition switch on. With one end of a jumper wire still connected to the negative post of the battery, contact the other end to each



of the wire terminals in the primary circuit in order, working from the coil back toward the battery, attempting to start the engine each time the contact is made with the jumper wire. The faulty unit or wire is the one located between the last terminal on which a start was made and the terminal from which the engine would not start. Tighten the connections or replace faulty unit or wires as required. Refer to fig. 11.

(4) **CHECK COIL, CONDENSER, AND DISTRIBUTOR.** Disconnect the high tension wire from the bottom of the coil, and plug in a high tension test wire. Hold the end of the test wire  $\frac{3}{16}$  inch from the cylinder head while cranking the engine with the starter. If the spark will not jump a  $\frac{3}{16}$ -inch gap, install a condenser that is known to be in satisfactory condition, and repeat the test. If the spark is still unsatisfactory, replace the coil, rotor, or distributor points, whichever may be required.

**b. Unsatisfactory Spark or No Spark from Some Wires.**

(1) **PRELIMINARY INSTRUCTIONS.** Remove any accumulation of moisture from the distributor terminal housing, coil, condenser, spark plugs, and spark plug wires. Check and tighten all ignition primary circuit wire connections and battery cable connections. Make sure the condenser is grounded.

(2) **CHECK SPARK FROM SPARK PLUG WIRES.** With the engine running at idle speed, remove, in turn, each spark plug wire from the spark plug, and hold it  $\frac{3}{16}$  inch from the cylinder head. If the spark will not jump the  $\frac{3}{16}$ -inch gap regularly, follow whichever of the following that apply.

(a) **NO SPARK FROM SOME WIRES.** If there is no spark from some of the spark plug wires and a satisfactory spark from the other wires, proceed with subpar. (3) below.

(b) **WEAK SPARK FROM SOME WIRES.** If a weak spark is obtained from some of the spark plug wires, proceed with subpar. (3) below.

(c) **WEAK SPARK FROM ALL WIRES.** If the spark is weak from all of the spark plug wires, proceed with subpar. (4) below.

(3) **CHECK SPARK PLUG WIRES AND TERMINAL HOUSING.** Replace any spark plug wires having worn or broken insulation. Clean the spark plug wire terminals in the terminal housing and make sure the spark plug wires are firmly seated.

(4) **SERVICE THE DISTRIBUTOR.** Remove the distributor, and check the condition of the contacts and adjust or replace them as required, and time the distributor.

## 20. CLUTCH.

a. If the clutch slips, chatters, grabs, or will not disengage, adjust the clutch pedal travel to obtain 1.0 inch free travel. If this does not correct the trouble, it will be necessary to remove the clutch for repairs.

## 21. STEERING.

**NOTE:** *Faulty steering control includes hard steering, loose steering, or wander.*

a. Inflate the tires to the specified pressure. Lubricate the steering gear and steering connections. Replace any tie rod or drag link ends that are loose or worn. Adjust the front wheel toe-in if necessary. Adjust the front wheel bearings if necessary. Check for looseness in the steering gear sector shaft, and adjust the steering gear if necessary. Check for sagging or broken springs, and repair or replace them if necessary. If the steering is still unsatisfactory, probably one of the following conditions exist: the front wheels are out of balance, spindle bolts and bushings are worn, one or both spindles or the axle beam are bent. The entire front end assembly should be thoroughly checked to determine the cause.

## 22. BRAKES.

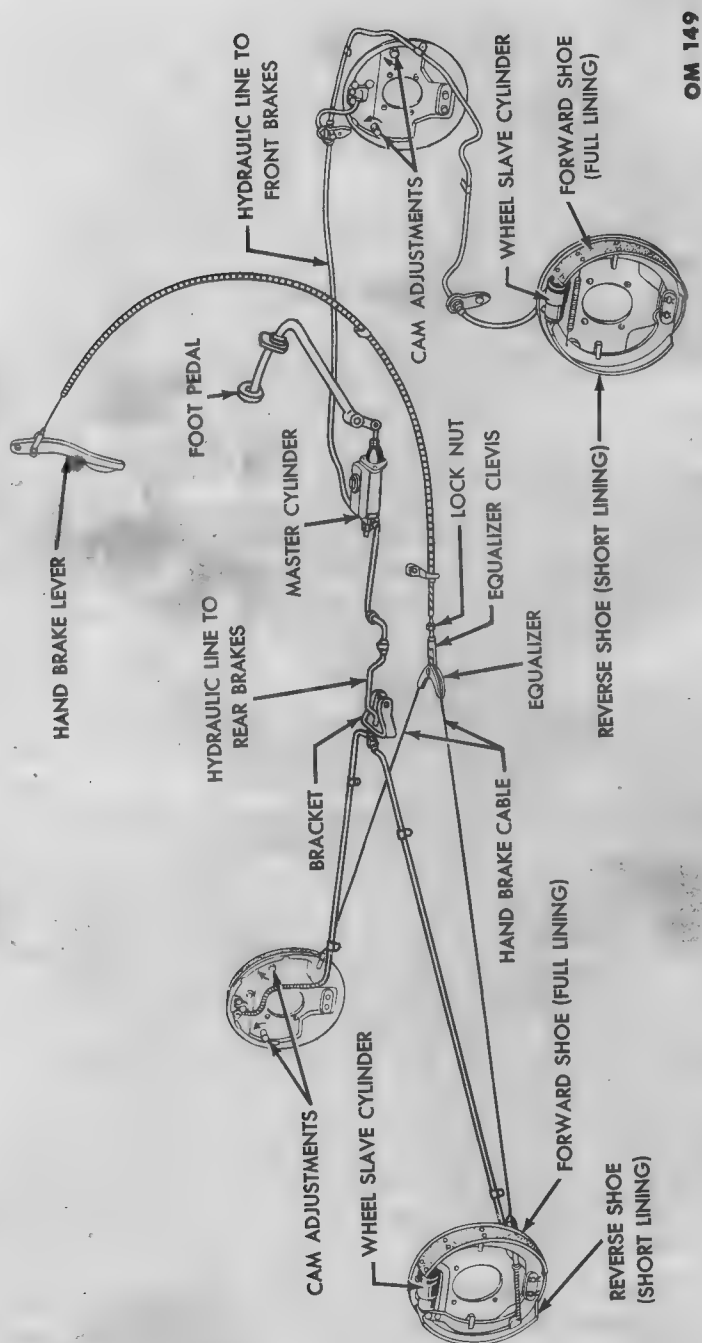
a. **Brake Pedal Travel Excessive.** If the pedal reserve is less than  $\frac{1}{2}$  of the total pedal travel, adjust the brakes.

b. **Ineffective Service Brakes.** Adjust the brakes. If the brakes are still unsatisfactory, remove the wheels and hubs, and inspect the brake shoe lining. If the lining is worn down to within  $\frac{1}{32}$  inch of the rivet heads or the lining is oil soaked, reline or replace the brake shoes. If any of the brake drums are worn excessively or scored, repair or replace the brake drums. If any of the slave cylinders are leaking fluid, repair or replace the slave cylinders.

c. **Spongy Pedal.** If the brake pedal action is spongy, bleed the air from the brake system.

d. **Uneven Service Brakes.** Inflate the tires to the specified pressure. If the brakes are still uneven, remove the wheels and drums. If the linings are worn excessively or are oil soaked, reline or replace the brake shoes. If any of the brake drums are scored, repair or replace the drums.

e. **Hand-brake Will Not Hold.** If the hand-brake will not hold the car when parked on grades normally encountered, adjust the hand-brake cable clevis (fig. 12).



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Fig. 12—Hydraulic and Hand-Brake System

**23. WINDSHIELD WIPER.**

a. Stop any vacuum leakage of the vacuum lines or connections at the manifold, at control connections, and at the wiper motor connections. Check condition of wiper hose at the manifold connection, if it is deteriorated, cut off the damaged portion and reconnect the wiper hose to the manifold. Make sure that the link arms are on the crank pins and properly locked in position. If this does not correct the trouble, repair or replace the motor.

## Section

## III

## SPECIFICATIONS

## 24. SPECIFICATIONS.

## a. General.

Model and wheelbase:

Model 899A ..... 144 in.

Over-all length (bumper to bumper) ..... 198 $\frac{3}{16}$  in.

Shipping weight:

Tudor Sedan ..... 3190 lbs

Tread:

Front ..... 58.0 in.

Rear ..... 60.0 in.

Tire size ..... 6.00 x 16—4 ply

Axle clearance:

Front ..... 7.12 in.

Rear ..... 8.14 in.

Turning circle diameter ..... 41 ft

## b. Capacities.

Fuel tank ..... 17 gals

Engine oil pan (less filter absorption) ..... 5 qts

Cooling system ..... 22 qts

Transmission ..... 2 $\frac{3}{4}$  ptsRear axle ..... 2 $\frac{1}{2}$  pts

Oil bath air cleaner ..... Fill to indicated level

Tire pressure, front and rear ..... 28 lbs

## c. Engine.

Type ..... 90 degree V-8

Horsepower ..... 100 at 3,800 rpm

Taxable horsepower ..... 32.5

Cylinder bore ..... 3.187 in.

Stroke ..... 3.75 in.

Piston displacement ..... 239.4 cu. in.

Torque ..... 180 ft lbs at 2000 rpm

Compression ratio ..... 6.75 to 1

## Valve push rod clearance:

Intake .....	0.010 to 0.012 in.
Exhaust .....	0.014 to 0.016 in.

## Compression pressure at cranking speed

(at sea level) .....	105 to 125 lbs
Engine mountings (2 front and 1 rear) .....	Rubber insulated

## d. Ignition System.

## Distributor:

Firing order .....	1-5-4-8-6-3-7-2
Drive .....	Directly by camshaft
Automatic spark advance .....	Vacuum controlled centrifugal governor
Automatic spark retard .....	Adjustable vacuum brake
Initial timing (degrees of crankshaft) .....	4° B.T.C.
Maximum advance (degrees of crankshaft) .....	26° B.T.C.
Distributor breaker cam .....	8 lobe
Breaker contacts .....	2 sets
Breaker contact spacing .....	0.014 to 0.016 in.
Breaker arm spring tension .....	20 to 24 ozs

## Spark plugs:

Size .....	14 MM
Gap .....	0.025 in.

## e. Fuel System.

Fuel gauge, type .....	Electric
Carburetor, type .....	Dual downdraft

## Adjustments:

Idle fuel adjustment .....	2 screws
Idle speed adjustment .....	1 screw
Accelerating pump stroke .....	Link

## Fuel pump:

Type .....	Diaphragm
Drive .....	Push rod from eccentric on camshaft
Pressure .....	2.0 to 3.25 lbs.

## f. Cooling System.

## Water pumps:

Number used .....	2
Type .....	Centrifugal
Drive .....	V-belt



## Fan:

Type .....	4 blade
Drive .....	V-belt

## Thermostats:

Number used .....	2
Starts to open .....	148°F.
Fully open .....	153°F.

## g. Electrical System.

## Generator:

Type .....	2-brush
Drive .....	V-belt
Rating .....	30 amperes at 7 volts
Capacity .....	220 watts

## Generator regulator:

Cutout closing voltage .....	6.1 to 6.3
Voltage regulator (at 70°F. ambient) .....	6.9 to 7.2
Current limitation amperage .....	30 to 33

## Battery:

Type .....	6-volt
Number of plates (each cell) .....	17
Capacity in ampere-hours .....	120
Terminal grounded .....	Positive

## Starting motor:

Type .....	6-volt
Drive .....	Automatic

## Lights:

## Headlights:

Type .....	Sealed beam (two filament)
Headlight switch location .....	Instrument panel
Headlight beam control switch location .....	Floor
Parking light bulbs C.P. ....	3
Body light bulbs C.P. ....	3
Tail and stop light bulbs C.P. ....	3 and 21
License plate light bulb C.P. ....	3
Instrument panel light bulbs C.P. ....	1½
Luggage compartment light bulb C.P. ....	3

## h. Transmission.

Type .....	Selective sliding gear
Number of speeds forward .....	3

**i. Clutch.**

Type .....	Single plate
Release bearing (pre-lubricated) .....	Ball bearing
Clutch pedal free travel .....	1.0 in.

**j. Rear Axle.**

Type .....	$\frac{3}{4}$ floating
Gear ratio:	
Standard .....	3.78 to 1
Optional .....	4.11 to 1

**k. Brakes.****Service brakes:**

Type .....	Internal expanding
Control .....	Hydraulic
Adjustment at each wheel .....	2 cams
Brake pedal free play .....	$\frac{1}{4}$ in.
Thickness of lining—all brake shoes .....	0.195 to 0.205 in.
Width of lining—all brake shoes .....	1.705 to 1.735 in.

**Length of lining:**

Forward shoe .....	13.5 in.
Reverse shoe .....	10.28 in.
Total brake lining area .....	162 sq in.
Diameter of brake drums, front and rear .....	12 in.

**Diameter of wheel slave cylinders:**

Front brake forward shoe .....	1.375 in.
Front brake reverse shoe .....	1 in.
Rear brake forward shoe .....	1.125 in.
Rear brake reverse shoe .....	1 in.

**Hand brake:**

Type .....	Mechanically operated internal
Control .....	Cable to service brakes in rear wheels

**l. Steering Gear.**

Type .....	Worm & Roller
Ratio .....	18.2 to 1
Steering wheel diameter .....	18 in.

**m. Wheel Alinement.**

Caster: .....	Degrees
Maximum .....	9
Minimum .....	$4\frac{1}{2}$
Maximum variation between wheels .....	$\frac{1}{2}$

Camber:	Degrees
Maximum .....	1
Minimum .....	$\frac{1}{4}$
Maximum variation between wheels .....	$\frac{1}{4}$

Camber of right-hand wheel should never be greater than left-hand wheel.

Camber plus spindle pin side inclination:

Maximum .....	9
Minimum .....	$8\frac{1}{4}$

Toe-in:	Inches
Maximum .....	$\frac{1}{16}$
Minimum .....	0

## WARRANTY

The Ford Motor Company warrants all such parts of new automobiles, trucks and chassis, except tires, for a period of ninety (90) days from the date of original delivery to the purchaser of each new vehicle or before such vehicle has been driven 4,000 miles whichever event shall first occur, as shall, under normal use and service, appear to it to have been defective in workmanship or material. This warranty shall be limited to shipment, to the purchaser without charge, except for transportation, of the part or parts intended to replace those acknowledged by the Ford Motor Company to be defective. The Ford Motor Company cannot, however, and does not accept any responsibility in connection with any of its automobiles, trucks or chassis when they have been altered outside of its own factories or branch plants. If the purchaser shall use or allow to be used in the automobile, truck or chassis, parts not made or supplied by the Ford Motor Company, then this warranty shall become void. This warranty is expressly in lieu of all other warranties expressed or implied and all other obligations or liabilities on the part of Ford Motor Company, and no person including any dealer, agent, or representative of the Ford Motor Company is authorized to make any representation or warranty concerning Ford Motor Company products on behalf of the Company except to refer purchasers to this warranty.

The Ford Motor Company reserves the right to make changes in design and changes or improvements upon its products without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

1948 Ford Station Wagon V8 Superdeluxe

Model 89A original motor : 899A-2260205

rebuilt motor : 799A-2002845



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